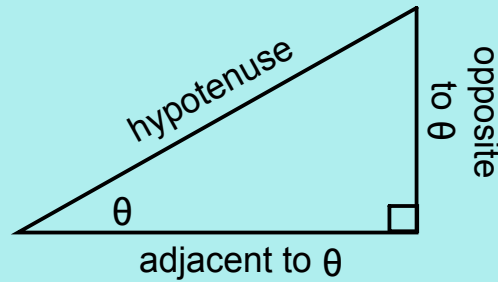


For any angle of interest, there are three (3) primary trigonometric ratios.

$$\text{sine of } \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\text{cosine of } \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\text{tangent of } \theta = \frac{\text{opposite}}{\text{adjacent}}$$



S o h C a h T o a

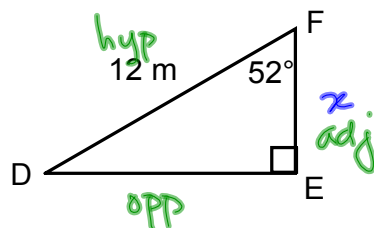
Dec 7-9:58 PM

Solving Right Triangles

Dec 12/2011

Recall: Trigonometric ratios can be used to determine side lengths or angle measures.

Ex.1 Calculate the height of the triangle shown below.



Soh Cah Toa

$$\cos 52^\circ = \frac{x}{12}$$

\therefore height of Δ is 7.4m.

$$x = 12 \cos 52^\circ$$

$$x \doteq 12 (0.6157)$$

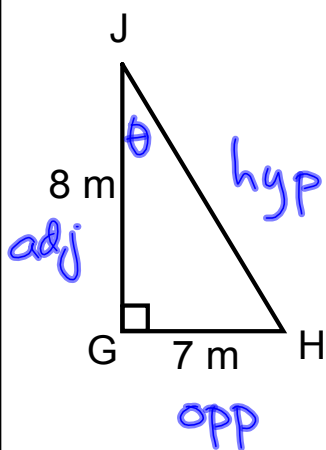
$$x \doteq 7.3884$$

$$x \doteq 7.4$$

$$x \approx 7.4$$

Dec 9-9:41 PM

Ex.2 Determine the measure of angle J in the triangle shown below.



Soh Cah Too

$$\tan \theta = \frac{7}{8}$$

$$\tan \theta = 0.875$$

$$\theta = \tan^{-1}(0.875)$$

$$\theta \doteq 41.185^\circ$$

$$\theta = 41.2^\circ$$

$$\tan \angle J = \frac{7}{8}$$

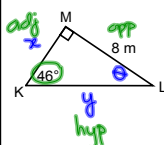
$$\tan J = \frac{7}{8}$$

May 11-3:47 PM

To solve a triangle means to find all the missing sides and angles.

For right triangles use Pythagorean Theorem and/or the primary trigonometric ratios.

Ex.3 Solve the triangle shown below.



$$\begin{aligned} \theta + 90^\circ + 46^\circ &= 180^\circ \\ \theta &= 180^\circ - 90^\circ - 46^\circ \\ \theta &= 44^\circ \end{aligned}$$

Soh Cah Too

$$\tan 46^\circ = \frac{8}{x}$$

$$x \tan 46^\circ = 8$$

$$\frac{x(1.0355)}{1.0355} = \frac{8}{1.0355}$$

$$x \doteq 7.7257$$

$$x \doteq 7.7$$

$$y^2 = x^2 + 8^2$$

$$y^2 = (7.7257)^2 + 64$$

$$y^2 = 123.6864$$

$$y = 11.1032$$

$$y \doteq 11.1$$

$$\sin 46^\circ = \frac{8}{y}$$

$$y \sin 46^\circ = 8$$

$$y = \frac{8}{\sin 46^\circ}$$

$$y \doteq 11.1213$$

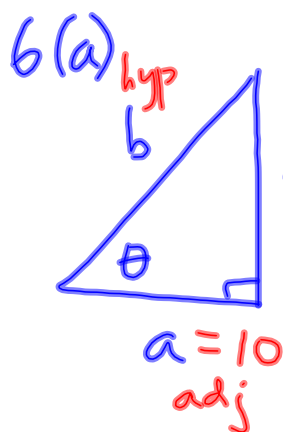
$$y \doteq 11.1$$

May 11-3:58 PM

Assigned Work:

p. 403-406 #1a, 2a, 3, 5a, 6a, 7a, 8a, 10, 12, 13ab

May 11-4:03 PM



$$a = 10$$

$$c = 10$$

~~Solve for~~ θ

$$\tan \theta = \frac{10}{10}$$

$$\tan \theta = 1$$

$$\theta = \tan^{-1}(1)$$

$$\theta = 45^\circ$$

Dec 13-9:12 AM

10.

Similar Δ 's
Pythagorean Δ 's
isosceles Δ 's

99

SohCahToa

$$\cos 60^\circ = \frac{4}{i}$$

$$i \cos 60^\circ = 4$$

$$i = \frac{4}{\cos 60^\circ}$$

$$i = \frac{4}{0.5}$$

$$i = 8$$

$$\tan 60^\circ = \frac{j}{4}$$

$$4 \tan 60^\circ = j$$

$$j = 4(1.7320)$$

$$j = 6.9282$$

$$j = 6.9$$

\therefore Side i is 8cm and j is 6.9cm

Dec 13-9:22 AM

13.(a)

$x = 9.4339$

$$x^2 = 8^2 + 5^2$$

$$x^2 = 64 + 25$$

$$x^2 = 89$$

$$x = \sqrt{89}$$

$$x = 9.4339$$

$$x = 9.4\text{mm}$$

$$\tan \theta = \frac{5}{8}$$

$$\tan \theta = 0.625$$

$$\theta = \tan^{-1}(0.625)$$

$$\theta = 32.005^\circ$$

$$\theta = 32^\circ$$

$$\alpha = 180^\circ - 90^\circ - 32^\circ$$

$$\alpha = 58^\circ$$

Dec 13-9:30 AM